



Test report No:
20B0117R-RF-US-P20V01

FCC Exposure TEST REPORT

Product Name	Wireless Access Point
Trademark	Extreme Networks
Model and /or type reference	AP510CX
Applicant's name / address	Extreme Networks, Inc. Extreme Networks, 6480 Via Del Oro / San Jose, CA 95119 U.S.A.
Test method requested, standard	KDB 447498D01V06 FCC Part1.1310
Verdict Summary	IN COMPLIANCE
Documented By (name / position & signature)	Tim Cao/Project Engineer 
Reviewed by (name / position & signature)	Frank He/ Technical Supervisor 
Approved by (name / position & signature)	Jack Zhang/ Supervisor 
Date of issue	2021-04-07
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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Nov. 04, 2020
Date (start test)	Nov. 21, 2020
Date (finish test)	Mar. 31, 2021

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
T_x	: Transmitter
R_x	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
20B0117R-RF-US-P20V01	V1.0	Initial issue of report.	2021-01-25
20B0117R-RF-US-P20V01	V2.0	Page 10~11: Update test data. (The test report No.: 20B0117R-RF-US-P20V01 V2.0 is to place the test report No.: 20B0117R-RF-US-P20V01 V1.0, and test report 20B0117R-RF-US-P20V01 V1.0 is obsoleted.)	2021-04-07

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with KDB 447498 and FCC Part 1.1310
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results relate only to the samples tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
 - Chapter 1.3 Antenna Informaion.

1. RF Exposure Evaluation

1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product	:	Wireless Access Point
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Antenna information:

2.4G:

Antenna model / type number.....:	Dipole Antenna: AI-DQ04360S Sector Antenna: ML-2452-SEC6M4-036		
Antenna serial number.....:	N/A		
Antenna Delivery	<input checked="" type="checkbox"/>	1TX + 1RX	
	<input checked="" type="checkbox"/>	2TX + 2RX	
	<input checked="" type="checkbox"/>	3TX + 3RX	
	<input checked="" type="checkbox"/>	4TX + 4RX	
	<input type="checkbox"/>	Others:.....	
Antenna technology	<input checked="" type="checkbox"/>	SISO	
	<input checked="" type="checkbox"/>	MIMO	<input type="checkbox"/> Basic
			<input checked="" type="checkbox"/> CDD
			<input type="checkbox"/> Sectorized
<input checked="" type="checkbox"/>	Beam-forming		
Antenna Type	<input checked="" type="checkbox"/>	External	<input checked="" type="checkbox"/> Dipole
			<input checked="" type="checkbox"/> Sector
			<input type="checkbox"/> Others.....
	<input type="checkbox"/>	Internal	<input type="checkbox"/> PIFA
			<input type="checkbox"/> PCB
			<input type="checkbox"/> Metal Antenna
Antenna Type	Dipole Antenna: AI-DQ04360S	Sector Antenna: ML-2452-SEC6M4-036	
SISO Antenna Gain	5.5 dBi	6.9 dBi	
CDD-MIMO(2TX) Antenna Gain	5.5 dBi for Power ,8.51 dBi for PSD	6.9 dBi for Power ,9.91 dBi for PSD	
CDD-MIMO(4TX) Antenna Gain	5.5 dBi for Power ,11.52 dBi for PSD	6.9 dBi for Power ,12.92 dBi for PSD	
Beamforming(2TX) Antenna Gain ..	8.51 dBi for Power; 8.51 dBi for PSD	9.91 dBi for Power; 9.91 dBi for PSD	
Beamforming(4TX) Antenna Gain ..	11.52 dBi for Power; 11.52 dBi for PSD	12.92 dBi for Power; 12.92 dBi for PSD	

5G:

Antenna model / type number	Dipole Antenna: AI-DQ04360S Sector Antenna: ML-2452-SEC6M4-036		
Antenna serial number.....	N/A		
Antenna Delivery	<input checked="" type="checkbox"/>	1TX + 1RX	
	<input checked="" type="checkbox"/>	2TX + 2RX	
	<input checked="" type="checkbox"/>	3TX + 3RX	
	<input checked="" type="checkbox"/>	4TX + 4RX	
Antenna technology	<input checked="" type="checkbox"/>	SISO	
	<input checked="" type="checkbox"/>	MIMO	
		<input checked="" type="checkbox"/> CDD	
		<input checked="" type="checkbox"/> Beam-forming	
Antenna Type	<input checked="" type="checkbox"/>	External	<input checked="" type="checkbox"/> Dipole
			<input checked="" type="checkbox"/> Sector
			<input type="checkbox"/> Others.....
	<input type="checkbox"/>	Internal	<input type="checkbox"/> PIFA
			<input type="checkbox"/> PCB
			<input type="checkbox"/> Others.....
For indoors and outdoors elevation angle $\leq 30^\circ$			
Antenna Type	Dipole Antenna: AI-DQ04360S	Sector Antenna: ML-2452-SEC6M4-036	
SISO Antenna Gain	6.0 dBi	7.2 dBi	
CDD-MIMO(2TX) Antenna Gain	6.0 dBi for Power ,9.01 dBi for PSD	7.2 dBi for Power ,10.21 dBi for PSD	
CDD-MIMO(4TX) Antenna Gain	6.0 dBi for Power ,12.02 dBi for PSD	7.2 dBi for Power ,13.22 dBi for PSD	
Beamforming(2TX) Antenna Gain ...	9.01 dBi for Power; 9.01 dBi for PSD	10.21 dBi for Power; 10.21 dBi for PSD	
Beamforming(4TX) Antenna Gain ...	12.02 dBi for Power; 12.02 dBi for PSD	13.22 dBi for Power; 13.22 dBi for PSD	
For outdoors elevation angle $>30^\circ$			
Antenna Type	Dipole Antenna: AI-DQ04360S	Sector Antenna: ML-2452-SEC6M4-036	
SISO Antenna Gain	0 dBi	3.0 dBi	
CDD-MIMO(2TX) Antenna Gain	0 dBi for Power ,3.01 dBi for PSD	3.0 dBi for Power ,6.01 dBi for PSD	
CDD-MIMO(4TX) Antenna Gain	0 dBi for Power ,6.02 dBi for PSD	3.0 dBi for Power ,9.02 dBi for PSD	
Beamforming(2TX) Antenna Gain ...	3.01 dBi for Power; 3.01 dBi for PSD	6.01 dBi for Power; 6.01 dBi for PSD	
Beamforming(4TX) Antenna Gain ...	6.02 dBi for Power; 6.02 dBi for PSD	9.02 dBi for Power; 9.02 dBi for PSD	

Bluetooth:

Antenna model / type number.....:	N/A			
Antenna serial number.....:	N/A			
Antenna Delivery	<input checked="" type="checkbox"/>	1TX + 1RX		
	<input type="checkbox"/>	Others:.....		
Antenna technology	<input checked="" type="checkbox"/>	SISO		
	<input type="checkbox"/>	MIMO	<input type="checkbox"/>	Basic
			<input type="checkbox"/>	CDD
			<input type="checkbox"/>	Sectorized
			<input type="checkbox"/>	Beam-forming
Antenna Type	<input type="checkbox"/>	External	<input type="checkbox"/>	Dipole
			<input type="checkbox"/>	Sectorized
	<input checked="" type="checkbox"/>	Internal	<input type="checkbox"/>	PIFA
			<input type="checkbox"/>	PCB
			<input checked="" type="checkbox"/>	Metal plate type F antenna
Antenna Gain	4.2 dBi			

Note: The antenna information for the EUT are provided and confirmed by the client.

Power Density:**Standalone modes:****Dipole Antenna for Wifi:**

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 24.5 cm (W/m ²)	Power Density Limit (W/m ²)
2.4G Wifi	2400 ~ 2483.5	32.72	2.480	10
5G Wifi ETH 6	5150 ~ 5350 5470 ~ 5850	29.39	1.152	10
5G Wifi ETH 7	5150 ~ 5350	29.33	1.136	10

Sector Antenna for Wifi:

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 24.5 cm (W/m ²)	Power Density Limit (W/m ²)
2.4G Wifi	2400 ~ 2483.5	34.35	3.610	10
5G Wifi ETH 6	5150 ~ 5350 5470 ~ 5850	30.73	1.568	10
5G Wifi ETH 7	5150 ~ 5350	28.03	0.842	10

Metal plate type F antenna for Bluetooth:

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 24.5 cm (W/m ²)	Power Density Limit (W/m ²)
Bluetooth	2400 ~ 2483.5	9.64	0.012	10

Simultaneous transmission:

Dipole Antenna for Wifi:

Mode	Wireless Configure	Frequency Range (MHz)	Maximum EIRP (dBm)	Limit of Power Density S(W/cm ²)	Power Density S at R = 24.5 cm (W/m ²)	Rate	Limit
ETH 7 2.4G wifi + ETH 6 5G wifi + Bluetooth	2.4G Wifi	2400 ~ 2483.5	32.72	10	2.480	0.364	1
	ETH 6 5G Wifi	5150 ~ 5350 5470 ~ 5850	29.39	10	1.152		
	Bluetooth	2400 ~ 2483.5	9.64	10	0.012		
ETH 7 5G wifi + ETH 6 5G wifi + Bluetooth	ETH 7 5G Wifi	5150 ~ 5350	29.33	10	1.136	0.230	1
	ETH 6 5G Wifi	5470 ~ 5850	29.39	10	1.152		
	Bluetooth	2400 ~ 2483.5	9.64	10	0.012		

Sector Antenna for Wifi:

Mode	Wireless Configure	Frequency Range (MHz)	Maximum EIRP (dBm)	Limit of Power Density S(W/cm ²)	Power Density S at R = 24.5 cm (W/m ²)	Rate	Limit
ETH 7 2.4G wifi + ETH 6 5G wifi + Bluetooth	2.4G Wifi	2400 ~ 2483.5	34.35	10	3.610	0.519	1
	ETH 6 5G Wifi	5150 ~ 5350 5470 ~ 5850	30.73	10	1.568		
	Bluetooth	2400 ~ 2483.5	9.64	10	0.012		
ETH 7 5G wifi + ETH 6 5G wifi + Bluetooth	ETH 7 5G Wifi	5150 ~ 5350	28.03	10	0.842	0.242	1
	ETH 6 5G Wifi	5470 ~ 5850	30.73	10	1.568		
	Bluetooth	2400 ~ 2483.5	9.64	10	0.012		

The safety distance is 24.5cm for installed for Wireless Access Point without any other radio equipment.

_____ The End _____